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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,928	05/02/2006	Simon Deleonibus	434299-646	8398
46188	7590	11/19/2010		
Nixon Peabody LLP P.O. Box 60610 Palo Alto, CA 94306			EXAMINER SALERNO, SARAH KATE	
			ART UNIT 2814	PAPER NUMBER
			MAIL DATE 11/19/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/539,928

Applicant(s)

DELEONIBUS, SIMON

Examiner

SARAH K. SALERNO

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/28/10 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurata (US PGPub 2002/0005581) in view of Bae et al. (US PGPub 2003/0094662).

Claim 1: Kurata teaches a self aligned MIS transistor having in a substrate a source zone and a drain zone on either side of a channel zone, said source and drain zones comprising a buried zone (20) in the substrate and raised zone (21) stacked on the buried zone, as well as a T shaped gate structure comprising:

a vertical bar (13) located above the channel zone, surmounted by a horizontal bar (14) extending on either side of the vertical bar, said horizontal bar having a lower part, a lateral part and an upper part, the gate structure comprising a stacking of one or several conductive layers (13, 14), the gate structure having a base zone (12) at a base of the vertical bar,

wherein the gate structure is coated with a shaping material (15), said material covering the vertical bar of the T, the lower and lateral parts of the horizontal bar of the T, and the base zone of the T, said base zone covered by the shaping material covering at least a part of the buried zone of the gate structure covered by the shaping material at least a part of the buried zone of the source and drain zones and not the raised zone of the source and drain zones (FIG. 4C).

Kurata does not teach the base zone extending laterally beyond the base of the vertical bar of the T or the shaping material covering the base zone of the gate structure including portions thereof extending laterally beyond the base of the vertical bar of the T. Bae teaches the base zone (115) extending laterally beyond the base of the vertical bar of the T or the shaping material (155) covering the base zone of the gate structure including portions thereof extending laterally beyond the base of the vertical bar of the T to improve device characteristics (Fig. 9; ABS). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device taught by Kurata to have the base zone extending laterally beyond the base of the vertical bar of the T or the shaping material covering the base zone of the gate structure

including portions thereof extending laterally beyond the base of the vertical bar of the T to improve device characteristics as taught by Bae (Fig. 9; ABS).

Claim 3: Kurata teaches first extension zones (17) located between the channel and source and drain zones respectively and having a doping of the same natures as the source and drain zones but weaker [0056-0057].

Claim 8: Kurata teaches a method for manufacturing, on a semiconductor substrate, at least one self aligned MIS transistor having a source zone and a drain zone on either side of a channel zone, said source and drain zones comprising a buried zone (20) in the substrate and a raised zone (21) stacked on the buried zone, as well as a T shaped gate structure of low resistivity comprising a vertical bar (13) located above the channel zone, surmounted by a horizontal bar (14) extending on either side of the vertical bar, said horizontal bar having a lower part, a lateral part and an upper part, the gate structure comprising a stacking of one or several conductive layers (13, 14), the gate structure having a base zone (12) around the base of the vertical bar of the T, the method comprising a step of forming a solid shape having the T shape of the gate that one wishes to form, and the coating of said shape in a shaping material (15), said shaping material coating the lateral surface of the vertical bar of the T, and the lower and lateral surfaces of the horizontal bar of the T, wherein said shaping material also covers the base zone of the gate structure and at least a part of the buried zone of the source and drain zones and does not cover the raised zone of the source and drain zones (FIG. 4C).

Kurata does not teach the gate structure having a base zone at a base of the vertical bar, said base zone extending around the base of the vertical bar of the T. Bae teaches the base zone (115) at the base of the vertical bar, said base zone extending laterally beyond the base of the vertical bar of the T to improve device characteristics (Fig. 9; ABS). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device taught by Kurata to have the base zone extending laterally beyond the base of the vertical bar of the T to improve device characteristics as taught by Bae (Fig. 9; ABS).

4. Claims 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurata (US PGPub 2002/0005581) and Bae et al. (US PGPub 2003/0094662), as applied to claim 1 above, and further in view of Rodder (US Patent 6,246,091).

Regarding claim 4, as described above, Kurata and Bae substantially read on the invention as claimed, except Kurata and Bae do not teach the second extension zones between the channel and source and drain zones respectively have a doping of nature opposite to that of the source and drain zones. Rodder teaches the second extension zones (105) between the channel and source and drain zones respectively have a doping of nature opposite to that of the source and drain zones to form barrier pocket regions between the source/drain regions and the channel of a transistor reducing short channel effects (Col. 1-2). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device taught by Kurata and Bae to include the second extension zone to form barrier pocket regions

between the source/drain regions and the channel of a transistor reducing short channel effects as taught by Rodder (Col. 1-2).

Claim 5: Rodder teaches the second extension zones (105) between the first extension zones (104) and the channel zone have respectively a doping of nature opposite to that of the source and drain zones (Col. 6).

Claim 7: Rodder teaches the stacking of layers constituting the gate structure lodged in the shaping material is intrinsic polysilicon or a metal (Col. 5).

5. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurata (US PGPub 2002/0005581) and Bae et al. (US PGPub 2003/0094662), as applied to claim 1, 8 above, and further in view of Chen (US Patent 6,077,733).

Regarding claims 6 and 10, as described above, Kurata and Bae substantially read on the invention as claimed, except Kurata and Bae do not teach the shaping material is made of silicon nitride (Si₃N₄) or hafnium oxide (HfO₂) or zirconium oxide (ZrO₂) or aluminum oxide (Al₂O₃). Chen teaches the shaping material is of silicon nitride (Si₃N₄) or hafnium oxide (HfO₂) or zirconium oxide (ZrO₂) or aluminum oxide (Al₂O₃) as being known in the art as silicon oxide substitutions (Col. 5-6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the shaping material taught by Kurata and Bae to be silicon nitride (Si₃N₄) or hafnium oxide (HfO₂) or zirconium oxide (ZrO₂) or aluminum oxide (Al₂O₃) because they are known in the art as taught by Chen. The selection of something based on its known suitability for its intended use has been held to support a

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prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

6. Applicant's arguments with respect to claims 1, 3-8 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH K. SALERNO whose telephone number is (571)270-1266. The examiner can normally be reached on M-R 8:00-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wael M Fahmy/
Supervisory Patent Examiner, Art
Unit 2814

/S. K. S./
Examiner, Art Unit 2814